Draft3 9/30/04

Estimating Historical Intrinsic Production Potential: Interior Columbia Stream Type Chinook and Steelhead Populations.

Goal: ***For each ESU population, characterize areas within freshwater tributary habitat with respect to the ability to support salmon or steelhead production based on natural characteristics.***

Overview

No consistent, direct estimates of historical (pre-settlement) production potential are available across interior TRT watersheds. The analysis described below is intended to provide a simple and objective overview of the distribution of production potential across the tributary habitats used by Interior basin stream type chinook and steelhead. The analysis is relatively coarse scale and is intended to be used in combination with more specific studies aimed at particular watersheds or basins.

The approach is patterned after analyses of the production potential of salmonids in other domains. The Puget Sound TRT developed an approach for estimating production potential (measured as spawners/unit length) from basic habitat measures - stream width (bankfull, m), stream gradient, valley width and vegetative cover. The approach relies on a relationship between salmon spawner densities and channel characteristics (Montgomery et al., 1999). Puget Sound chinook is generally ocean-type - migrating to salt water after a few months of rearing in freshwater. Similar sets of habitat measures have been used as the basis for map based approaches to estimating production potential for coho and steelhead in Oregon coastal watersheds (e.g., Nickelson et al. 1992; Burnett, 2001). Those methodologies incorporate derived relationships between the habitat characteristics and juvenile rearing capacity or relative survival.

Direct measures of the productivity of a particular reach in terms of life stage survivals are difficult to generate and are rarely available at fine scales. The following analysis assumes that relative densities of juveniles measured at a consistent life stage reflect the production potential of a particular reach. Consistently higher relative densities under particular physical conditions may be the result of active habitat selection by adults or juveniles or of higher survival.

The criteria developed in this analysis are based primarily on empirically observed relationships between summer rearing densities of juveniles and physical habitat characteristics. The results of the juvenile based assessments are modified to reflect empirically observed limits to spawner distribution - specifically by a set of minimum criteria for stream width. The resulting habitat ratings are intended to characterize the quantity and the distribution of habitats capable of sustaining both spawning and rearing within Interior Columbia Basin watersheds. This also facilitates comparisons with empirical data on the current distribution of spawners. It is important to recognize that the productivity of spawners in a particular reach can be influenced by rearing conditions in upstream and downstream reaches. For example, stream reaches below the minimum width cutoff associated with spawning may provide important summer rearing habitat for steelhead in a particular tributary.

With the exception of Snake River fall chinook, Interior Basin listed chinook and steelhead populations are predominately stream-type - rearing for a year or more in freshwater before migrating to the ocean as smolts. It is commonly assumed that rearing conditions during the summer after emergence and the following winter are key determinants of year class strength for populations predominated by a stream type life history pattern. For stream type chinook, there is evidence that habitat conditions supporting relatively high densities for rearing also support relatively high spawning densities - at least in upland tributaries characterized by relatively confined stream channels. The correspondence between spawning and rearing areas may not be as strong for steelhead populations. Interior basin steelhead generally spawn during the spring flow period. In many cases juvenile steelhead disperse and use other areas for summer rearing and overwintering. The following approach to estimating the intrinsic capacity assumes that summer and winter rearing habitat are key factors determining the relative productivity of freshwater tributary reaches.

Steelhead and chinook salmon appear to be adapted to take advantage of different types of freshwater habitat. Juvenile densities of both yearling and stream type chinook are typically highest in relatively low gradient, unconfined stream reaches with well defined pool structure (e.g., Hillman& Miller, 2002, Petrosky & Holubetz, 1988). Steeper gradient relatively confined tributary reaches typically support the highest relative densities of juvenile steelhead (e.g., Slaney et al., 1980, Petrosky & Holubetz,1988, Burnett, 2001). Steelhead have also been reported to use braided mainstem reaches for spawning and rearing, given appropriate flow, temperature and substrate conditions (e.g., ODFW, 1972).

Steps:

1. Identify criteria for defining upper and lower boundaries to salmon/steelhead production in Interior Basin ESU watersheds.

2. Review available data sets relating simple measures of habitat characteristics to production potential for salmon and/or steelhead and select one or more habitat characteristics representative of high, low or moderate levels of fish productivity.

3. Develop or acquire GIS layers incorporating key habitat measures related to salmon and steelhead production potential for Interior Basin ESU populations.

4. For each population, assign spawning/rearing reaches with respect to salmon and steelhead production potentials - as high, moderate, low or none.

5. Aggregate and summarize production potential for salmon and steelhead by HUC-6 within each population.

Methods:
Upstream limits on the potential use of tributary habitat for spawning and rearing by salmon and steelhead were defined in terms of stream width and gradient. Minimum stream widths capable of supporting spawning were estimated based on available width measurements for index reaches with documented redd counts and on expert opinion of biologists familiar with Interior Columbia spawning reaches.

For spring chinook, we used two data sets; 1) results from recent USFWS efforts in the Middle Fork Salmon River and a regression model (see below) of stream width at low summer flows; and 2)index average stream widths for Grande Ronde spawning reaches to estimate the minimum stream width associated with spawning. For steelhead, we used John Day index area redd count data, O. mykiss (juvenile?) presence/absence data from ODFW, and IDFG transect parr count data sets from the Salmon and Clearwater basin. In both the spring chinook and steelhead analyses, we took the 95th percentile low value for bankfull and wetted width to delineate our upstream extent. Use of smaller tributaries for juvenile rearing has been documented (e.g., Nez Perce tribal comment letter). Spawning in smaller tributaries may occur in particular situations.

Reaches above gradient barriers were also excluded as production areas. A slope of greater than 20% within a 200 meter reach was defined as a gradient barrier to steelhead spawning. Stream reaches with gradients above 5% were also excluded as spawning/rearing areas based on expert opinion and on a review of index reach data sets for Interior Basin streams.

The lower reaches of many interior basin tributaries are subject to relatively high summer temperatures - well above levels injurious to salmon and steelhead. Current temperature regimes are significantly influenced by human activities for many interior drainages. There are relatively few specific analyses of historical temperature regimes for Interior Columbia basin drainages. Persistent high temperature levels can have a significant impact on the ability of a given reach to sustain juvenile rearing and adult spawning. We adopted the temperature criteria used by Chapman & Chandler (2001) - weekly mean average temperature (WMAT) exceeded 22 degree C - to identify situations where temperature could potentially limit or exclude salmon and steelhead production. *Note: the initial set of variables used in this analysis do not reflect the effects of groundwater on ameliorating temperatures in mainstem reaches with broad, alluvial flood plains (e.g., lower Yakima).*

Parr Density Data
In the early to mid 1980's, IDFG biologists compiled a baseline data set for evaluating the effectiveness of habitat improvement projects. The data set included both measures of parr

densities (chinook and steelhead/rainbow trout) and habitat measures. The study concluded that chinook parr densities were the highest in low gradient stream sections in relatively wide valleys and that steelhead/rainbow juvenile densities were the highest in steeper gradient, more confined reaches (e.g., Petrosky & Holubetz, 1988). Maximum parr densities were also influenced by sediment levels. The original analyses focused on data collected in years with relatively high parental escapements to minimize the confounding effect of relatively low seeding (Petrosky and Holubetz, 1988). We used data from naturally seeded areas from that parsed data set for the current analyses. For each species, parr densities were plotted against gradient and stream width within two valley width categories corresponding to B channel and C channel designations (Rosgen, 1985) used in the original study. Wider stream reaches known to be used for spawning and rearing by at least steelhead were not well represented in the Idaho baseline study. A second data set, compiled by the Washington Department of Game for larger rivers in western Washington and Puget Sound, was also analyzed to provide some insight into production relationships in larger systems.

Spawning/Rearing Production Criteria

Four different habitat measures were used to define a set of criteria for estimating reach specific production potential for stream type chinook and steelhead using interior Columbia basin tributary habitats. The four habitat criteria selected were stream width (estimated or measured as bankfull width), stream gradient (percent change in elevation over reach), valley width (relative width of valley associated with a stream reach) and riparian vegetation. Results from the analysis are summarized by species in Table 1.

Stream width (bankfull width and wetted widths) Three stream width categories were established based on an examination of the data sets; 3 to 25 m, 25 - 50 m and >50 m. Streams less than 3 m in bankfull width were at the lower margins sampled in the Idaho baseline study. As a result, initial potential analyses assumed that streams less than 3 m would not sustain rearing and spawning for both stream type chinook and steelhead. Presence/absence data provided by the Nez Perce Tribal staff indicates that some streams less than 3 m support production (at least seasonally) for steelhead. No specific data were provided to identify an alternative cut-off width. WDFW has recommended using 2 m wetted width as a lower limit for steelhead in western Washington streams (reference). ODFW has compiled extensive steelhead spawning ground surveys for the John Day basin, including associated wetted widths for index reaches. 41 out of 43 of the reaches had recorded widths above 2m. The WDG study included mainstems up to 50 m in width. Steelhead parr densities at gradients exceeding 1.0 remained at relatively high levels in the widest streams.

Based on these analyses, we set lower limits relative to spawning/rearing potential of 3.6 m (wetted width) for chinook and 3.8 m (bankfull width) for steelhead, respectively. Spring chinook spawn in the late summer and early fall, summer wetted width is an appropriate measure of stream size relative to this time period. Steelhead spawn in the late spring on the end of the spring freshet, bankfull width is a more appropriate measure of stream size relative to this period.

Valley width. The Idaho baseline study classified streams as B type or C type channels using criteria proposed by Rosgen (1985). Given the intent to develop criteria that could be applied using a GIS analysis, we developed a specific measure to use in defining a particular area as if valley width exceeded 20 times bankfull width at the midpoint of a stream segment it was classified as a C channel type. Streams characterized by bankfull width less than 100 m were treated in a separate category and assumed to be B type.

Gradient: A set of gradient categories was developed based upon the Puget Sound TRT chinook matrix (e.g., Table 2 in WRIA 18 Draft Summary Rept - Puget Sound Chinook Recovery Analysis Team) and the categories used in the Idaho and Washington Game Dept. studies. For chinook, most of the observed parr density/stream gradient data pairs fell within the 3 to 25 m streamwidth category (Figure 1). In general, densities were relatively high at gradients below 1.0 to 1.5 % gradients. Although observations were relatively sparse, densities were relatively low at gradients exceeding 1.5 to 2.0 percent. The frequency of samples exhibiting low pool cover (less than 50%) increased rapidly as gradients exceeded 1.5%. Steelhead/rainbow exhibited the reverse pattern with relatively low densities at gradients below 0.5, increasing as gradients increased to approximately 4% (Figure 2). Densities remained relatively high at gradients between 2% and approximately 10%. In the western Washington study, densities followed a similar pattern.

Note: The next iteration of this assessment will divide the 4% to 10% gradient category and assign a reduced potential to gradients exceeding 6-7% based on expert opinion cited in the draft Lower Columbia TRT Viability Report technical appendix( ).

Riparian vegetation: One additional modifier was incorporated into the framework based on the Puget Sound chinook example. Pool structure in Puget Sound was affected by the availability of large woody debris. It was not possible to evaluate the potential linkage with riparian cover with the Idaho parr density/habitat baseline data base. For the purposes of this study, we included the assumption that the availability of LWD from adjacent riparian areas (where designated as Mesic forest or similar classifications) would result in increased pool structure in moderate gradient reaches.

Note: reviewers have suggested considering incorporating a measure of the aquatic productivity of a watershed (e.g. based on lithology).

Figure 1. Idaho Spring/Summer Chinook. *Juvenile densities vs. stream gradient for naturally seeded baseline monitoring areas in the Salmon and Clearwater River systems. Parsed data set- low seeding years not included (Petrosky and Holubetz, 1988). Dotted lines indicate assigned category boundaries.*

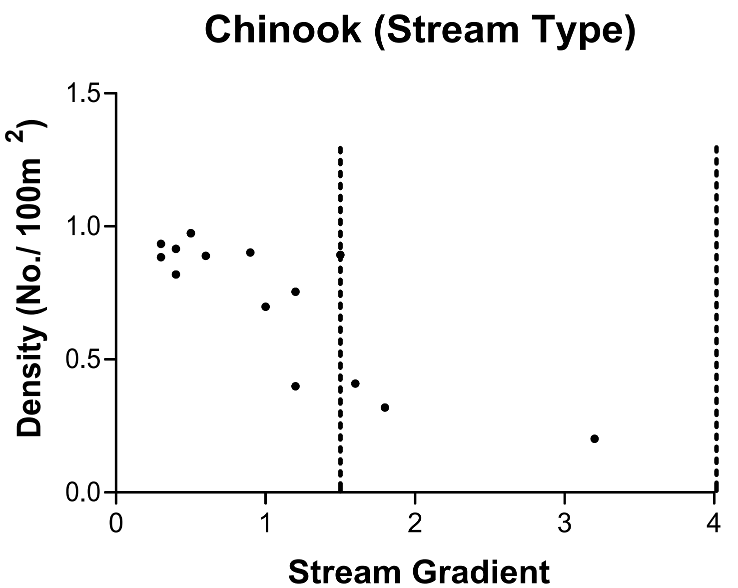


Figure 2. Idaho Steelhead. *Juvenile densities vs. stream gradient for naturally seeded baseline monitoring areas in the Salmon and Clearwater River systems. Parsed data set- low seeding years not included (Petrosky and Holubetz, 1988). Dotted lines indicate assigned category boundaries.*

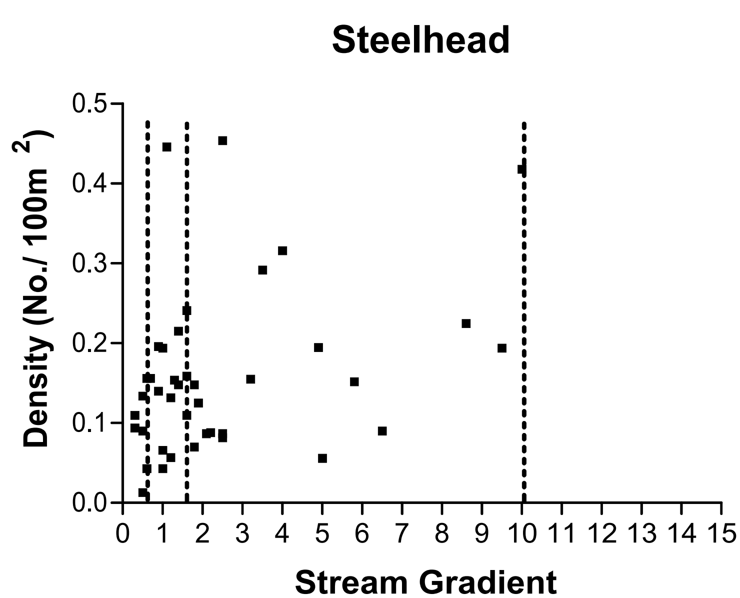


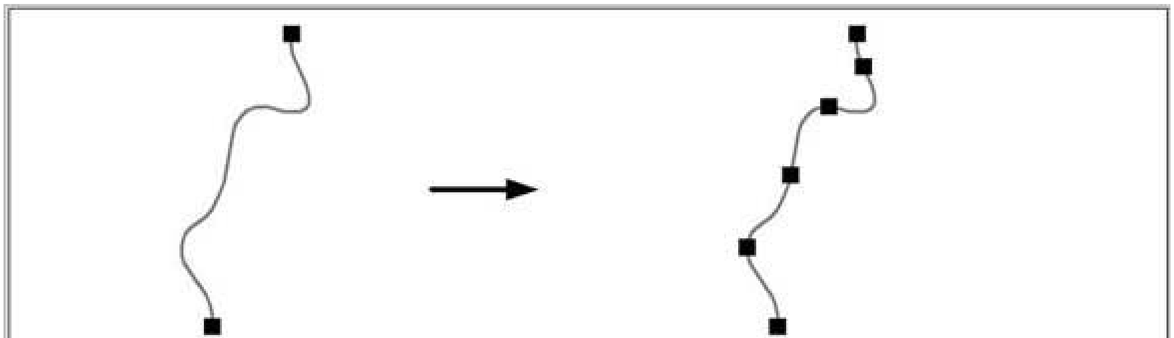
Table 1. Criteria for assigning tributary habitat stream reaches to productivity categories for chinook and steelhead densities.

Stream Width (Bankfull)	**Stream Reach Gradient**	**Valley Width Associated with Stream Reach**	**Steelhead Density Rating**	**Chinook Density Rating**
Less than 25 m Bankfull width (For spring/summer chinook, limited to streams 3.6 m wetted width or greater for chinook, 3.8 m bankfull width for steelhead)	0.0 to 0.5	< 20 X Stream Width	Low	Medium
		> 20 X Stream Width	Low	**High**
	0.5 to 1.5	< 20 X Stream Width	Medium	**High (Mixed Forest)** Medium (Other Riparian)
		> 20 X Stream Width	Medium	**High**
	1.5 to 4.0		**High**	Low
	4.0 to 10.0		**High**	Primarily Migration
	> 10.0		Low	Primarily Migration
	>15.0		None	None
25-50 Bankfull Width	0.0 to 0.5		Low	Medium
	0.5 to 4.0		Medium	Low

Chinook and Steelhead Habitat Mapping

Three distinct habitat measures were generated and used to quantify intrinsic potential for Interior Columbia Basin spring chinook and summer steelhead populations: stream gradient, active channel width and valley width (relative confinement of stream). Various GIS data sets were used to determine these metrics for tributary habitats, the most important being digital elevation models and hydrographic themes.

A networked stream layer based on the National Hydrography Framework (NHD) 1:100,000 dataset was developed as a first step in the mapping exercise. Only natural hydrographic features were used, reaches obviously altered by anthropogenic activities such as ditches, drains and canals were removed for the analysis. Using ESRI's AVENUE programming language, a script was developed that compiled an output table containing each unique segment divided into 200 meter sections. These segments were then used as the functional unit for additional analyses. Each segment was attributed with a unique "address" to be used for linear referencing with the NHD networked stream layer (figure 3). This methodology produced an end segment which was less than 200 m (StreamLength - (200 * n)), these were excluded from further analyses. Ultimately, over 500,000 individual segments were created within the Interior Columbia Basin ESUs using routed event theme processes.



Length	name
871.70	Rock Creek

Length	Fromd	Tod	name	address
200.00	0.00	200.00	Rock Creek	200 Rock Creek
200.00	200.00	400.00	Rock Creek	400 Rock Creek
200.00	400.00	600.00	Rock Creek	600 Rock Creek
200.00	600.00	800.00	Rock Creek	800 Rock Creek
71.70	800.00	871.70	Rock Creek	879 Rock Creek

Figure 3. Example of linear referencing, showing conversion from single feature to multiple segments

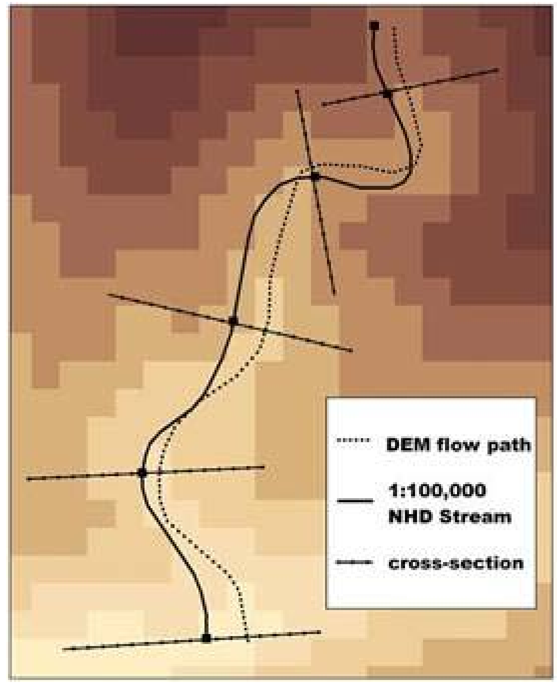


Figure 4. Spatial non-congruency between differently scaled features, showing cross-sectional placement.

Gradient was calculated by intersecting the stream segments with the digital elevation model (USGS 30 meter resolution) and dividing a segment's elevation change by its length. Assigning elevations to stream segments posed some significant accuracy problems. This was primarily due to the lack of spatial concurrence between the 1:100,000 stream layer and the 1:24,000 digital elevation models. The stream segments did not always match the flow paths inherited from the DEMs, so alternate methods were developed for correcting this spatial discrepancy. Using principles of euclidean geometry, perpendicular cross-sections were created for all stream segments (figure 4). These cross-sections were then analyzed using zonal statistics in order to calculate their corresponding minimum elevation (which would be the center of the DEM generated flow). With the DEM flow path elevations known, a minimum and maximum value were then assigned to each stream segment and gradient values calculated. All stream reaches below those segments exhibiting a 20% gradient were assumed to be potentially accessible to chinook salmon and steelhead. The results of applying this model to the Grande Ronde River basin are depicted in attachment Map 1.

A simple model was developed and used for calculating channel width based on measures recorded in small scale habitat studies and photo interpretations. This methodology was built upon similar efforts undertaken by the Puget Sound TRT (Davies, Lagueux 2003). Measured widths (bankfull) were compared to basin area and accumulated precipitation using linear regression techniques. Analyses were conducted independently between major basins in order to ensure model effectiveness, and reduce the impact of potentially significant basin specific characteristics. The analyses indicated that the relationship of channel width to basin size and accumulated precipitation were highly significant and positive. The resulting regression models were applied to their respective watersheds and summarized by 200 m stream segments. The results of applying the model to the Grande Ronde basin are depicted in Attachment Map 2.

Valley width was the third variable calculated based on information in GIS data layers. Again, AVENUE was employed for coding automated scripts for spatial theme development. Flow paths from the DEMs were isolated and their elevations were analyzed using Euclidean allocation techniques in ArcView's Spatial Analyst. By subtracting the Euclidean allocation theme from the original DEM, it is possible to create a theme showing the change in elevation between the stream (flow path) and the adjacent topography. For this analysis, a 3 meter rise in

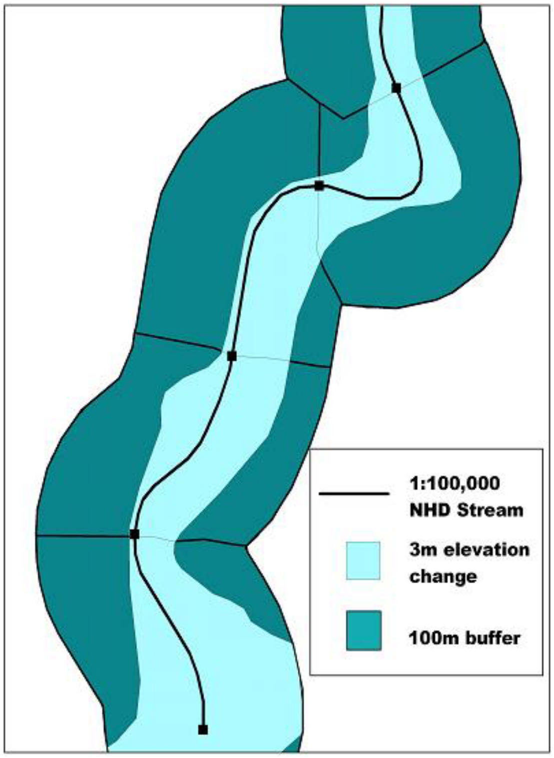


Fig 5. Graphic showing the area of the 100m buffer occupied by a 3m change in elevation.

elevation was used as a standardized metric for computing relative valley width. Once this portion of the analysis was complete, a buffer was developed for each unique stream segment. The percentage of the buffer that was occupied by the change in elevation theme served as a relative measurement for stream confinement and valley width (figure 5). For example, if 100 % of the buffer was filled, then the valley width would be at least as wide as the buffer, and the stream classified as unconfined.

Preliminary temperature analyses were also conducted for evaluating salmonid habitat. However, unlike the other variables, this was not applied directly to the rating of habitat quality but was instead used for defining the extent of thermal barriers and hence the downstream limit to smolt survivability. Building upon previous studies ( ), elevation, air temperature, and landcover type were used to develop regression equations for predicting maximum weekly mean water temperatures. The primary goal was to produce a contour showing where the maximum weekly mean was greater than or equal to 22EC. An initial analysis show that these relationships are significant, and that the delineation of thermal barriers may be possible.

Stream gradient, active channel width and valley width (confinement) were used to classify individual reaches relative to their potential for supporting chinook and steelhead rearing using the results of the mapping exercise and the species specific rule sets described in Table 1. Each segment was designated as "High ", "Medium", "Low" or "Primarily Migration" with respect to each species. The results were compiled by HUC-6 and by population for each ESU.

Relative Densities

The intrinsic potential ratings described above were applied at the 200 m reach scale. The resulting intrinsic potential rating were summarized at the HUC-6, (subwatershed), HUC-5 (major watersheds) and population level. The metrics used included total stream km by category/species, total m2 by category/species, and a weighted index of relative capacity. The weighted index was generated by assigning a relative rating to each general category – high, medium and low. Units of habitat rated with high production potential for a species were given a weight of 1. Units of medium production potential were given a relative rating of 0.5 and habitat units classified as low production potential were assigned a relative rating of 0.25. A relative index of productivity for aggregate areas (HUC-6, HUC-5 or population level) was calculated by summing the weighted total amounts of habitat within each category within the appropriate geographic units. The ratios of 1 to .5 to .25 for high, medium and low intrinsic potential categories reflect the patterns observed in the WDG steelhead parr density study (Gibbons et al., 1985, table 6) and are generally consistent with relative densities reported for spring chinook late fall parr in the Idaho studies.

Results - Interior Columbia Basin
The results of applying the habitat rating criteria across Interior Basin tributary population areas are depicted in attachment Map 3 (a, b, c ,d, and e) and summarized in Table 2. We have summarized the information at the watershed (HUC-6 and HUC-5) and population level by aggregating the habitat ratings generated for the 200 m reach level features. Results at the reach level should be interpreted with caution - actual production potential at the reach level could be substantially affected by local variations in the basic physical parameters generated for this analysis as well as by variations in stream structure, geology, vegetative cover, etc.

Spring chinook
The total amount of spawning habitat (H/M rating width greater than 3m) was summed over all reaches within each HUC-5 for chinook population areas defined for the listed Interior Columbia Basin ESUs (Snake River Spring Summer Chinook and Upper Columbia Spring Chinook). H/M stream kms were also totaled at the population level.

The median amount of reach habitat rated as High/Medium potential within HUC-5 watersheds was 25 km, ranging from 0 to approximately 100 km (within a Snake River Little Salmon River HUC-5). 90% of the HUC-5s within population boundaries contained 10 or more kms of high/med spawning habitat.

Steelhead
Steelhead tributary population areas were generally larger than the areas associated with spring/summer chinook. This largely reflects the wider range of spawning conditions characteristic of steelhead and the paucity of detailed empirical information on spawning distribution (due largely to the timing of spawning during freshet conditions).

The median amount of spawning habitat (high/medium intrinsic potential rating) per HUC-5 was 75 km for steelhead populations compiled across all three Interior Columbia listed ESUs (Upper Columbia, Middle Columbia and Snake River). 90% of the HUC-5s within steelhead population tributaries contained between 18 and 172 km of high/medium rated habitat.

The population groupings were based on physical measures of habitat - stream gradient and width were the determining factors for steelhead spawning potential. Other factors can substantially affect the relative productivity of a particular reach or watershed including temperature conditions and aquatic productivity. We do not have a comprehensive data set representing historical (pre 1850) stream temperatures for Interior Columbia tributaries. We used regression models based on available stream temperature-elevation data to characterize reach specific temperature regimes. Those projections reflect the factors driving stream temperatures during the periods of observation and are not necessarily representative of historical conditions. However temperature mapping based on those relationships can be used to identify populations that are subject to relatively high stream temperatures during key rearing (and spawning periods). The intrinsic spawning or rearing potential estimates for populations exhibiting relatively high potential temperature impacts should be validated using alternative information wherever possible.

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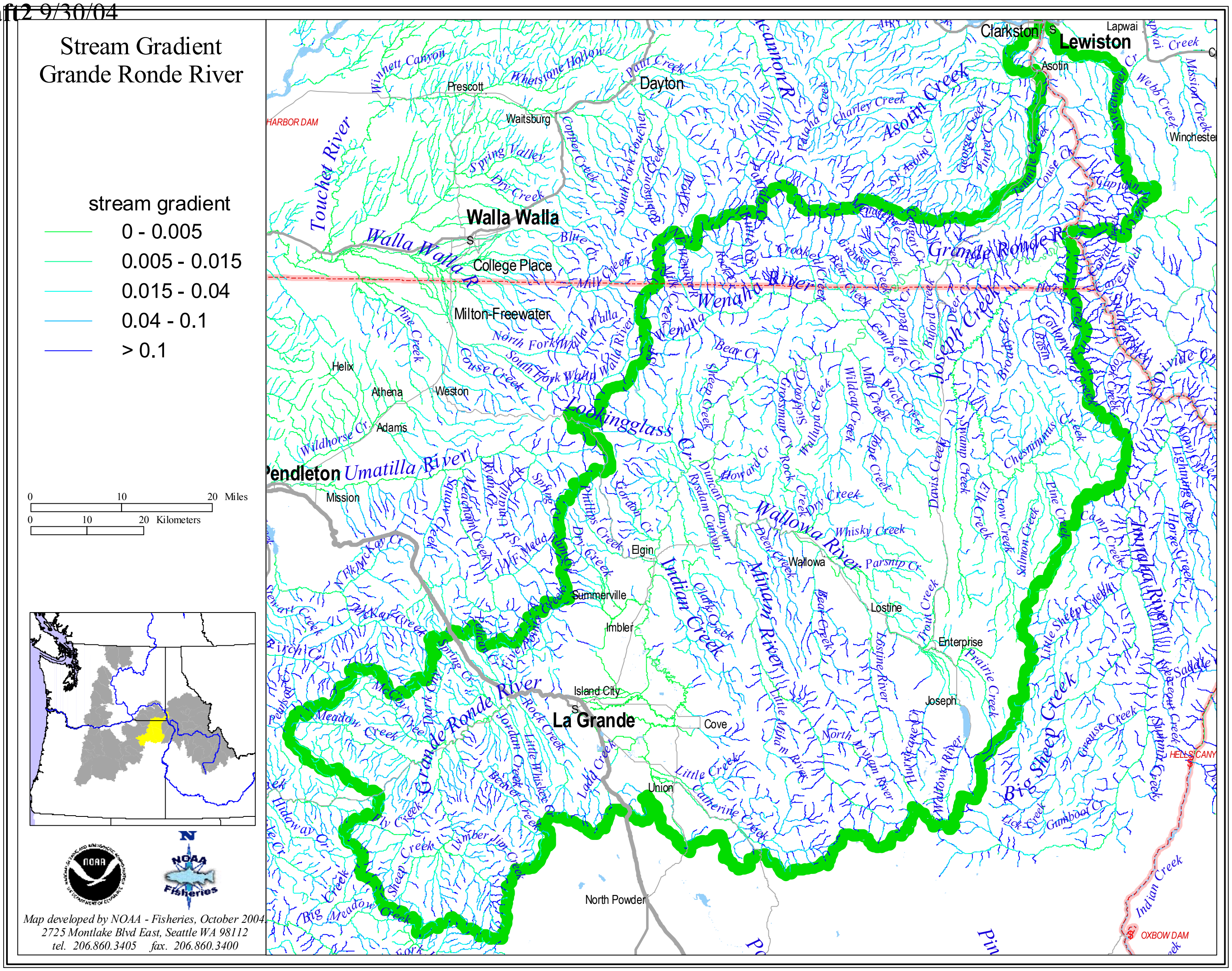
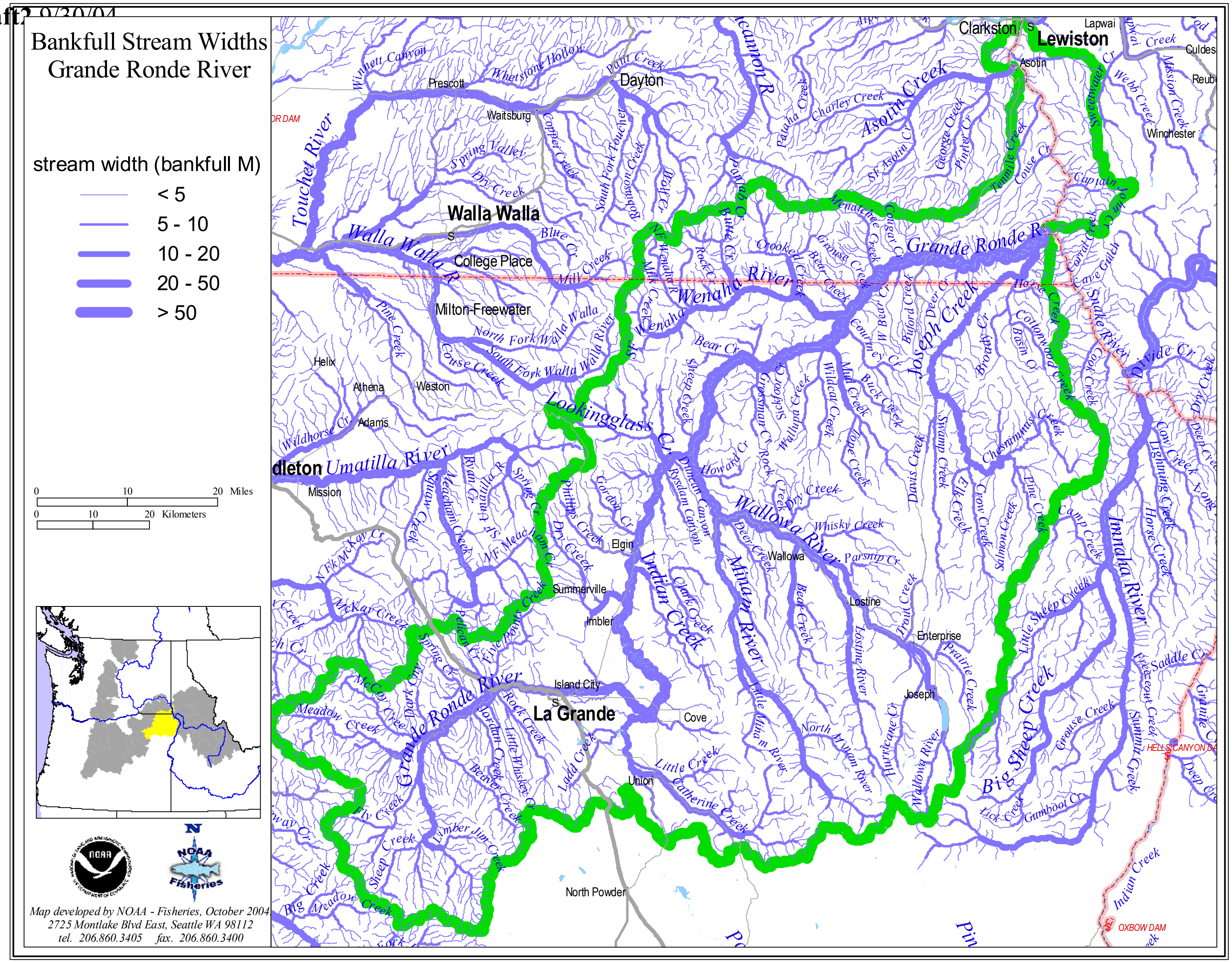


Map 1. Results of gradient calculations (using 200m segments) within the Grande Ronde Basin.



Map 2. Results of bankfull width calculations (using 200m segments) within the Grande Ronde Basin.

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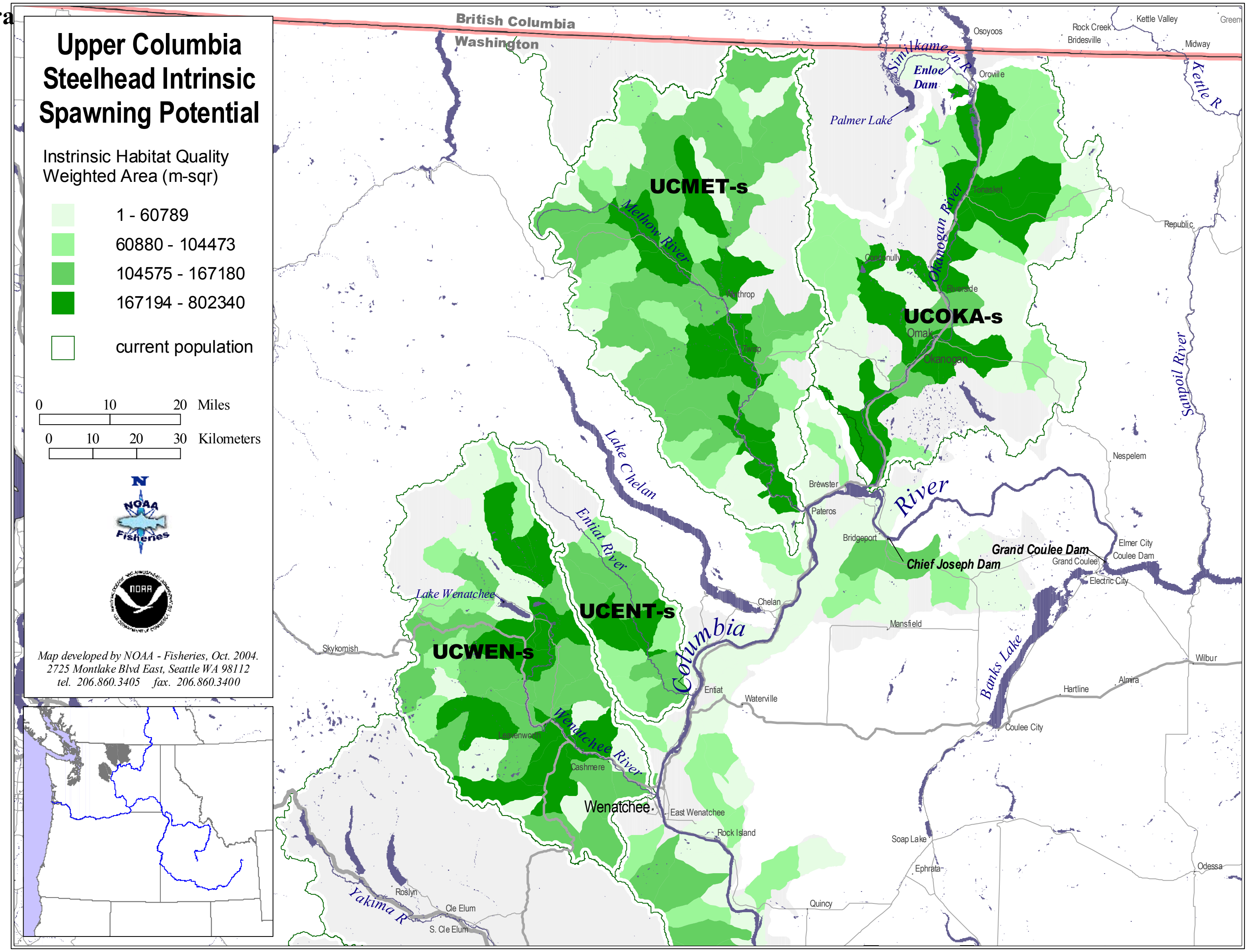
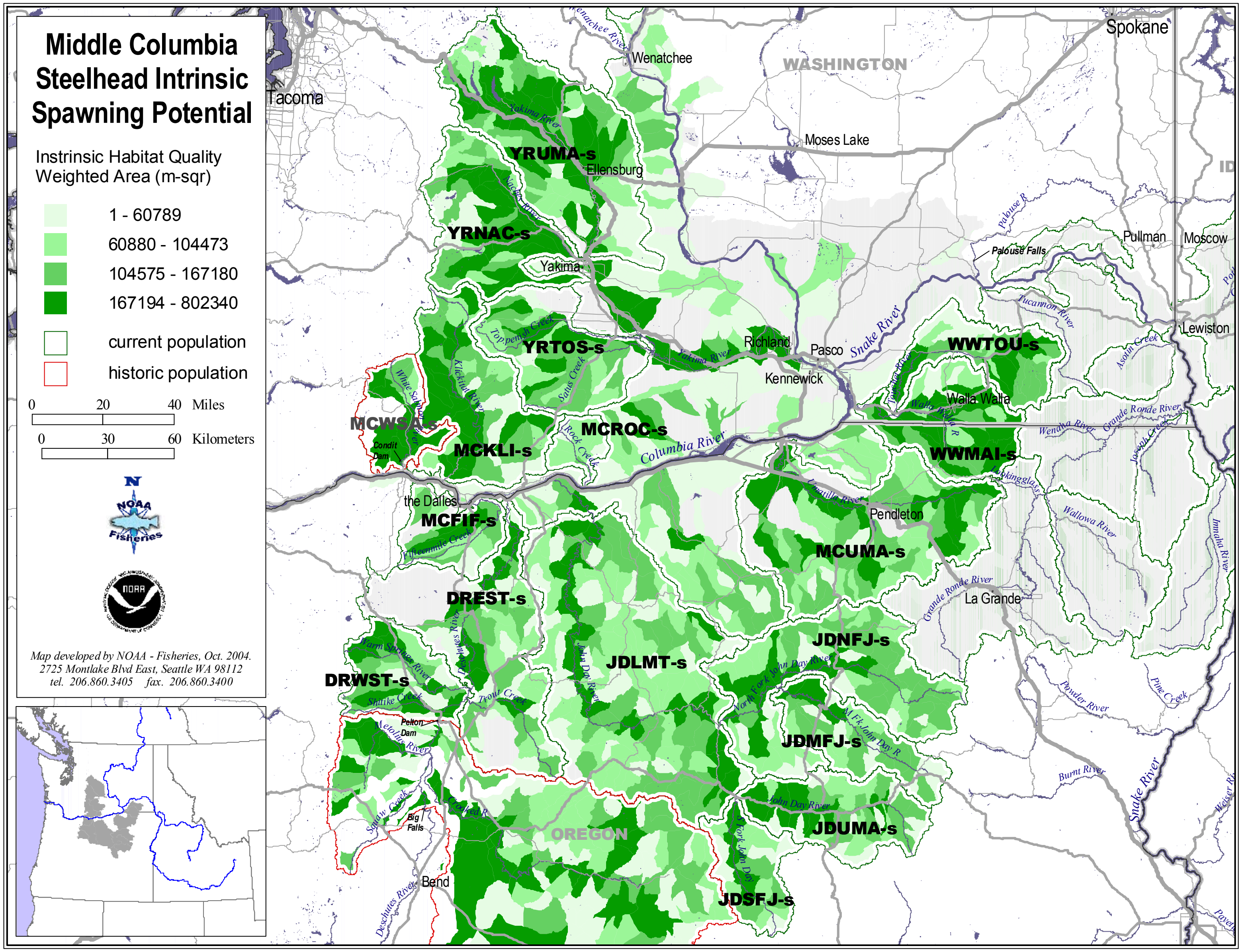


Map3a. Results of intrinsic analysis for Upper Columbia Summer Steelhead, summarized by HUC-6.



Map3b. Results of intrinsic analysis for Middle Columbia Summer and Winter Steelhead, summarized by HUC-6.

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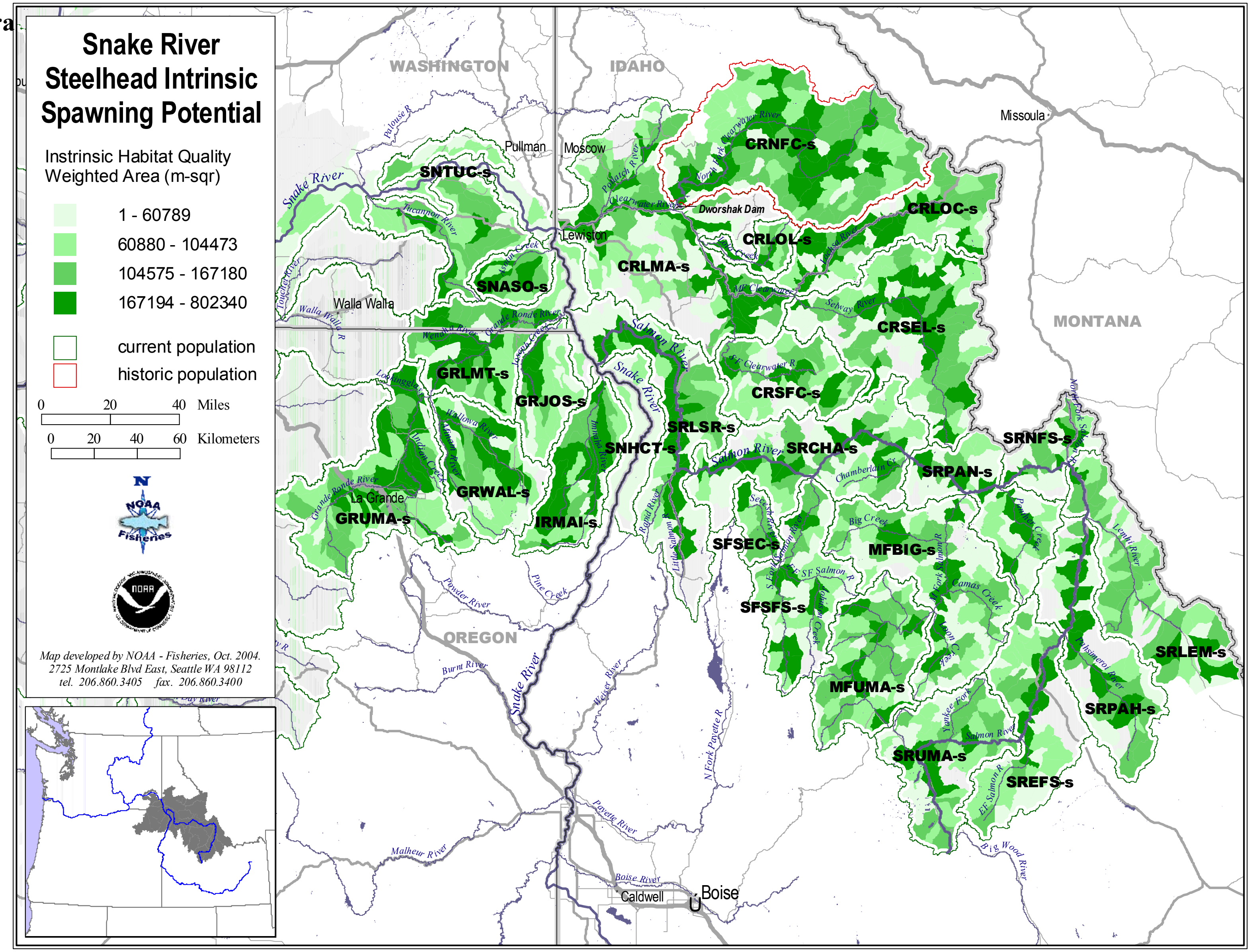
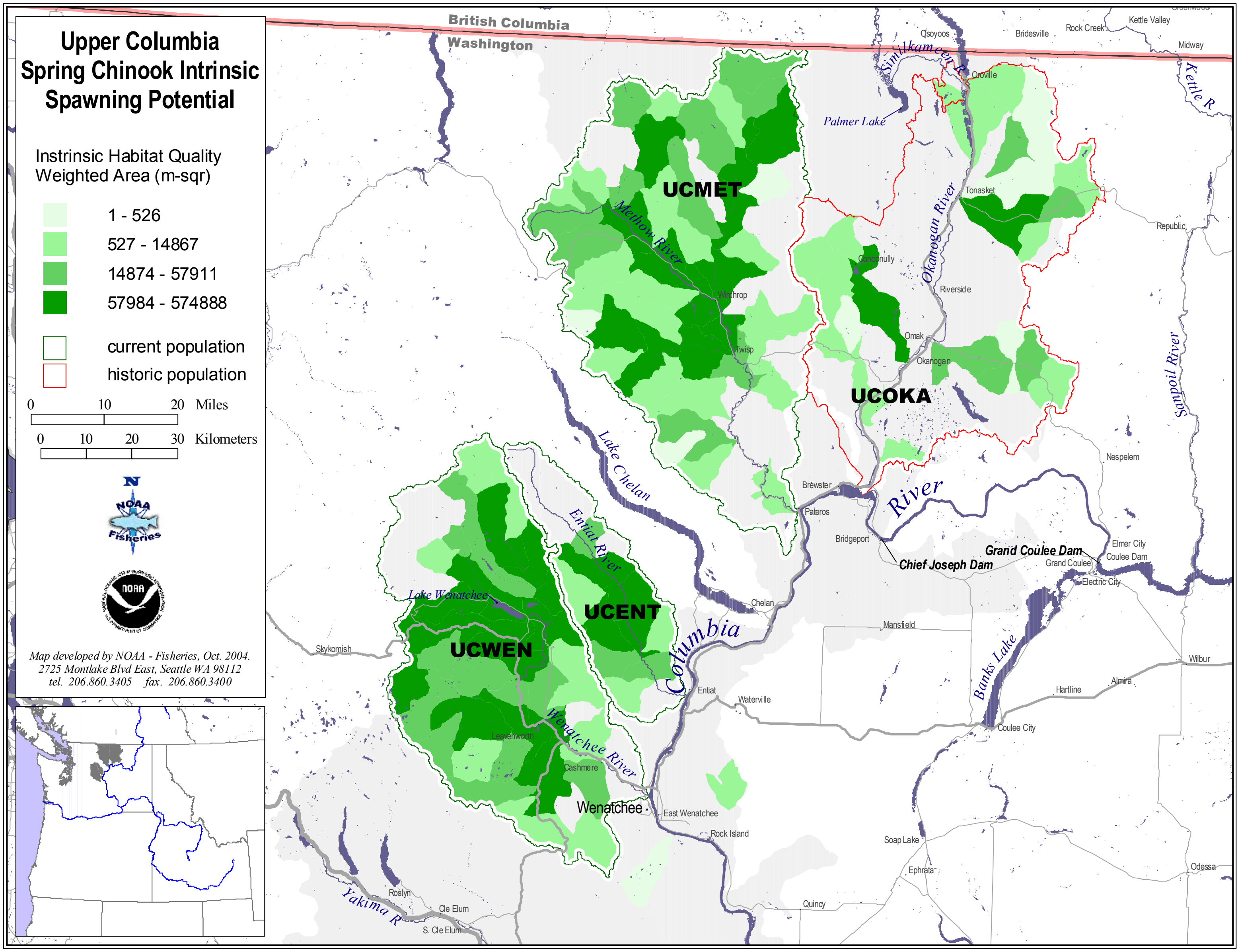


Map3c. Results of intrinsic analysis for Snake River Summer Steelhead, summarized by HUC-6.



Map3d. Results of intrinsic analysis for Upper Columbia Spring Chinook, summarized by HUC-6.

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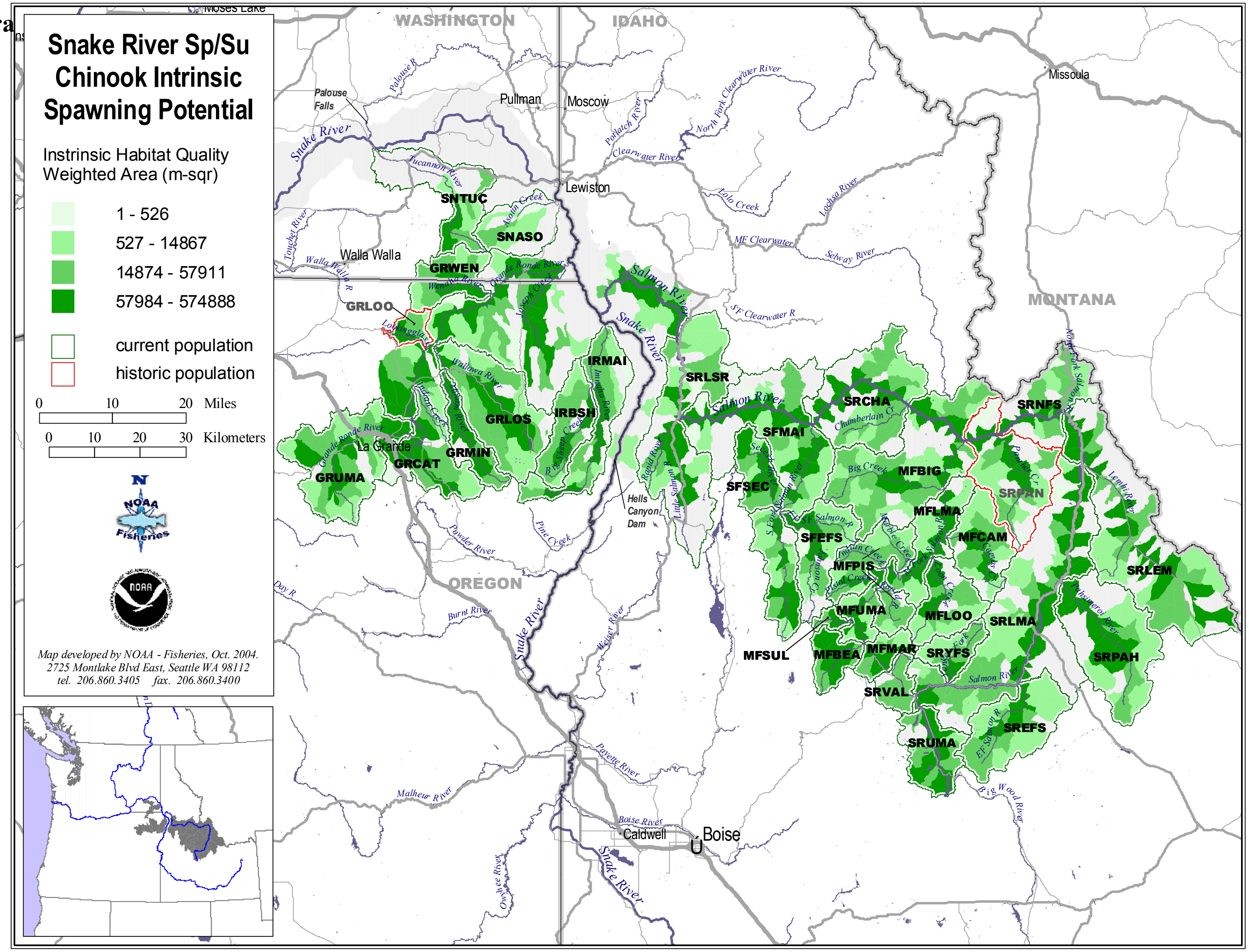

Map3e. Results of intrinsic analysis for Snake River Spring and Summer Chinook, summarized by HUC-6.

Annex 1 to Appendix D

Spawning/Rearing Habitat
ESU: Snake River Spring Chinook

Estimated Kilometers of Spawning/Rearing Habitat
(July 9, 2004 GIS output data summary)

Population	*HUC-5*	*Not Rated*	*Low*	*Medium*	*High*	*Sum (Hi & Med)*
Catherine Cr.	***Population***	***458.3***	***72.1***	***20.0***	***184.9***	***204.9***
	1706010405	141.3	16.2	3.0	36.3	39.3
	1706010406	120.2	14.2	0.8	47.9	48.7
	1706010409	132.1	39.1	15.8	35.7	51.5
	1706010407	64.7	2.6	0.4	65.1	65.5
Wallowa/Lostine R.	***Population***	***509.4***	***99.5***	***30.9***	***178.3***	***209.2***
	1706010504	53.5	18.8	0.2	10.4	10.6
	1706010502	18.1	12.4	1.8	22.0	23.8
	1706010503	119.7	14.4	8.4	36.7	45.1
	1706010506	211.3	32.3	19.9	32.2	52.1
	1706010501	106.8	21.6	0.6	76.9	77.5
Minam R.	***Population***	***106.2***	***20.4***	***6.4***	***58.9***	***65.3***
	1706010505	106.2	20.4	6.4	58.9	65.3
Upper Grande Ronde R.	***Population***	***1221.5***	***146.1***	***22.2***	***258.2***	***280.4***
	1706010408	74.1	5.4	0.0	42.1	42.1
	1706010404	149.1	20.2	9.8	43.3	53.1
	1706010403	360.4	53.7	9.4	49.5	58.9
	1706010402	335.4	29.7	2.4	59.9	62.3
	1706010401	302.5	37.1	0.6	63.5	64.1
Lookingglass Cr.	***Population***	***88.2***	***25.0***	***1.8***	***14.8***	***16.6***
	1706010410	88.2	25.0	1.8	14.8	16.6
Wenaha R.	***Population***	***266.2***	***53.5***	***10.8***	***39.5***	***50.3***
	1706010603	266.2	53.5	10.8	39.5	50.3
Big Sheep Cr.	***Population***	***328.0***	***78.5***	***20.2***	***23.2***	***43.5***
	1706010204	214.9	48.9	7.2	11.2	18.4
	1706010203	113.2	29.7	13.0	12.0	25.0
Imnaha R.	***Population***	***388.8***	***81.7***	***55.5***	***50.7***	***106.2***
	1706010201	105.2	23.2	1.0	29.4	30.4

	1706010205	180.2	40.3	31.3	4.6	35.9
	1706010202	103.4	18.2	23.2	16.6	39.9
E Fk S Fk Salmon R.	***Population***	***128.3***	***38.3***	***12.4***	***92.9***	***105.4***
	1706020802	61.1	13.6	5.2	19.0	24.2
	1706020803	67.2	24.6	7.2	73.9	81.1

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
South Fork Salmon R.	***Population***	***523.5***	***222.9***	***31.6***	***128.4***	***160.0***
	1706020901	4.8	0.0	0.0	0.4	0.4
	1706020711	2.4	0.4	0.0	0.6	0.6
	1706020902	48.7	32.0	0.2	0.6	0.8
	1706020708	66.8	48.6	0.2	3.0	3.2
	1706020806	77.5	46.5	7.4	0.8	8.2
	1706020804	9.6	8.2	3.2	8.6	11.8
	1706020709	52.7	12.4	1.8	14.8	16.6
	1706020710	87.7	18.6	4.0	24.8	28.9
	1706020801	173.3	56.1	14.8	74.7	89.5
Secesh R.	***Population***	***122.1***	***50.1***	***6.2***	***71.9***	***78.1***
	1706020805	122.1	50.1	6.2	71.9	78.1
Asotin R.	***Population***	***525.1***	***67.1***	***18.8***	***16.4***	***35.2***
	1706010302	525.1	67.1	18.8	16.4	35.2
Tucannon R.	***Population***	***736.4***	***104.6***	***41.7***	***100.1***	***141.8***
	1706010707	170.9	14.2	12.6	18.6	31.2
	1706010706	302.0	41.3	15.0	39.1	54.1
	1706010705	263.5	49.1	14.0	42.4	56.5
Lower Salmon R.	***Population***	***634.7***	***207.1***	***146.9***	***80.9***	***227.8***
	1706020107	1.8	4.8	1.0	7.2	8.2
	1706020109	49.1	8.0	5.0	5.8	10.8
	1706020302	51.7	13.0	10.0	3.2	13.2
	1706020304	22.0	15.4	11.4	2.2	13.6
	1706020301	55.1	20.0	10.8	6.0	16.8
	1706020118	79.4	18.8	6.0	11.0	17.0
	1706020114	44.9	18.2	16.6	1.0	17.6
	1706020303	39.8	17.2	15.9	1.8	17.7
	1706020116	40.9	27.4	15.6	2.2	17.8
	1706020117	86.3	29.8	6.4	13.6	20.0
	1706020105	76.1	13.8	19.6	17.0	36.6
	1706020108	87.7	20.4	28.4	9.8	38.2
Little Salmon R.	***Population***	***498.3***	***160.7***	***35.3***	***143.4***	***178.7***
	1706020903	72.2	34.1	0.0	0.2	0.2
	1706020905	76.5	23.2	1.0	2.4	3.4
	1706021004	18.5	6.2	0.2	3.8	4.0
	1706020906	66.6	11.6	3.6	4.2	7.8
	1706021001	48.3	10.8	7.8	7.8	15.6
	1706021002	38.0	15.6	8.6	11.4	20.0
	1706020904	83.6	15.2	4.4	23.4	27.8
	1706021003	94.5	43.9	9.6	90.2	99.8

Population	*HUC-5*	*Not Rated*	*Low*	*Medium*	*High*	*Sum (Hi & Med)*
N Fk Salmon R.	***Population***	***218.7***	***62.3***	***32.8***	***24.6***	***57.5***
	1706020307	41.3	16.2	11.4	2.2	13.6
	1706020308	26.4	11.0	15.6	0.6	16.2
	1706020306	151.0	35.1	5.8	21.8	27.6
Bear Valley Cr.	***Population***	***62.1***	***25.6***	***9.0***	***120.8***	***129.8***
	1706020502	27.5	9.4	2.4	54.3	56.7
	1706020501	34.6	16.2	6.6	66.5	73.1
Big Cr.	***Population***	***394.2***	***149.0***	***36.7***	***90.5***	***127.2***
	1706020701	46.3	42.5	0.2	2.0	2.2
	1706020609	22.2	8.0	2.6	2.0	4.6
	1706020610	25.6	14.0	12.8	0.8	13.6
	1706020605	46.1	15.6	0.8	15.4	16.2
	1706020702	66.4	16.0	3.4	14.6	18.0
	1706020606	80.1	25.2	3.4	19.4	22.8
	1706020607	56.2	15.4	4.6	19.8	24.4
	1706020608	51.3	12.2	8.8	16.4	25.2
Camas Cr.	***Population***	***186.9***	***50.3***	***16.8***	***40.9***	***57.7***
	1706020602	76.5	17.0	3.6	11.2	14.8
	1706020604	44.5	16.6	2.8	12.8	15.6
	1706020603	65.9	16.6	10.4	16.8	27.2
Lower MF Salmon R.	***Population***	***171.1***	***68.1***	***41.7***	***9.4***	***51.1***
	1706020508	26.2	9.4	2.2	5.0	7.2
	1706020601	83.1	26.0	19.7	1.6	21.3
	1706020506	61.8	32.6	19.8	2.8	22.6
Loon Cr.	***Population***	***165.1***	***45.3***	***18.0***	***33.8***	***51.9***
	1706020511	55.6	14.0	3.2	9.2	12.4
	1706020512	43.0	9.6	6.2	8.4	14.6
	1706020510	66.6	21.6	8.6	16.2	24.8
Marsh Cr.	***Population***	***77.0***	***31.2***	***3.6***	***76.1***	***79.7***
	1706020503	77.0	31.2	3.6	76.1	79.7
Upper MF Salmon R.	***Population***	***330.1***	***91.8***	***31.6***	***97.5***	***129.2***
	1706020507	53.5	19.8	2.0	18.0	20.0
	1706020505	82.7	21.2	9.2	12.4	21.6
	1706020509	100.5	22.8	5.2	20.8	26.0
	1706020504	93.4	27.9	15.2	46.3	61.5

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
Chamberlain Cr.	***Population***	***225.0***	***125.8***	***5.6***	***65.3***	***70.9***
	1706020704	8.2	24.0	0.0	0.0	0.0
	1706020707	21.4	40.7	0.0	2.0	2.0
	1706020705	32.6	7.6	0.6	6.4	7.0
	1706020706	47.0	8.6	1.8	17.6	19.4
	1706020703	115.7	44.9	3.2	39.3	42.5
E Fk Salmon R.	***Population***	***183.8***	***63.1***	***52.5***	***41.8***	***94.3***
	1706020112	35.4	14.4	7.0	6.2	13.2
	1706020110	60.3	17.0	11.8	9.0	20.8
	1706020113	39.8	21.8	18.2	11.6	29.8
	1706020111	48.2	9.8	15.4	15.0	30.4
Lemhi R.	***Population***	***559.7***	***192.3***	***53.5***	***216.4***	***269.9***
	1706020403	32.8	10.4	1.0	11.2	12.2
	1706020405	58.8	22.0	4.1	12.2	16.3
	1706020407	118.9	21.8	7.4	9.0	16.4
	1706020305	81.9	22.2	18.6	5.6	24.2
	1706020406	34.6	12.4	4.4	20.8	25.2
	1706020401	27.4	6.2	0.0	27.3	27.3
	1706020408	54.7	19.8	10.6	23.6	34.3
	1706020404	63.0	27.6	3.4	32.8	36.3
	1706020402	29.8	26.0	0.4	37.3	37.7
	1706020409	57.8	23.6	3.6	36.5	40.1
Pahsimeroi R.	***Population***	***147.9***	***96.7***	***18.2***	***148.8***	***167.0***
	1706020205	5.4	0.4	2.8	22.6	25.4
	1706020201	46.7	23.8	9.4	21.4	30.8
	1706020202	57.2	27.6	4.6	29.4	34.0
	1706020204	25.5	16.6	0.8	36.4	37.2
	1706020203	13.0	28.2	0.6	38.8	39.4
Panther Cr.	***Population***	***315.6***	***78.3***	***32.2***	***55.1***	***87.3***
	1706020311	76.8	14.0	0.8	10.8	11.6
	1706020313	20.4	8.8	11.6	1.0	12.6
	1706020312	53.3	11.0	9.4	8.0	17.4
	1706020310	82.3	26.2	5.6	16.6	22.2
	1706020309	82.9	18.2	4.8	18.6	23.4
Upper Salmon R.	***Population***	***106.2***	***61.3***	***10.8***	***146.4***	***157.2***
	1706020102	15.4	8.2	0.4	31.0	31.4
	1706020101	35.7	22.0	1.4	54.7	56.1
	1706020103	55.1	31.0	9.0	60.7	69.7
Valley Cr.	***Population***	***70.8***	***31.2***	***2.8***	***81.1***	***83.9***
	1706020104	70.8	31.2	2.8	81.1	83.9
Yankee Fk.	***Population***	***102.0***	***32.8***	***9.2***	***36.8***	***46.1***
	1706020106	102.0	32.8	9.2	36.8	46.1

ESU: Upper Columbia Spring Summer Chinook

Kilometers of Spawning/Rearing Habitat

Population	*HUC-5*	*Not Rated*	*Low*	*Medium*	*High*	*Sum (Hi & Med)*
Entiat R.	***Population***	***271.9***	***58.2***	***22.4***	***42.8***	***65.2***
	1702001001	271.9	58.2	22.4	42.8	65.2
Methow R.	***Population***	***1,032.3***	***237.8***	***69.8***	***138.2***	***208.0***
	1702000802	79.8	30.8	1.2	15.8	17.0
	1702000807	273.8	51.6	13.8	4.0	17.8
	1702000803	67.9	24.8	1.6	21.6	23.2
	1702000801	55.7	18.2	5.0	21.0	26.0
	1702000805	180.8	27.0	9.8	21.8	31.6
	1702000804	148.4	28.0	12.6	32.2	44.8
	1702000806	225.9	57.4	25.8	21.8	47.6
Wenatchee R.	***Population***	***783.0***	***238.6***	***60.8***	***237.6***	***298.4***
	1702001105	310.4	76.1	5.0	21.4	26.4
	1702001103	97.4	53.0	20.6	43.2	63.8
	1702001102	95.8	22.2	5.6	59.8	65.4
	1702001104	191.4	60.0	11.6	54.0	65.7
	1702001101	88.0	27.2	18.0	59.0	77.0

ESU: Snake River Steelhead

Kilometers of Spawning/Rearing Habitat

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
Joseph Cr.	***Population***	***530.2***	***25.0***	***166.9***	***122.2***	***289.1***
	1706010604	236.5	5.4	54.7	35.7	90
	1706010606	116.2	7.2	38.1	53.3	91
	1706010605	177.4	12.4	74.1	33.2	107
Grande Ronde Lower MS	***Population***	***795.3***	***88.3***	***174.9***	***397.7***	***572.5***
	1706010601	57.2	22.4	33.1	45.3	78
	1706010303	231.9	12.0	15.2	68.1	83
	1706010607	166.6	35.7	46.3	54.5	101
	1706010602	153.7	7.6	31.7	105.0	137
	1706010603	185.8	10.6	48.7	124.8	173
Grande Ronde Upper MS	***Population***	***1,959.0***	***186.9***	***453.5***	***504.0***	***957.4***
	1706010407	50.1	55.3	19.0	8.4	27
	1706010408	72.3	16.0	27.2	6.0	33
	1706010406	103.8	25.6	25.2	28.4	54
	1706010404	138.1	21.6	35.8	26.8	63
	1706010410	53.7	4.4	16.2	55.5	72
	1706010405	108.1	10.0	32.4	46.2	79
	1706010409	112.2	22.4	30.8	57.1	88
	1706010402	330.4	4.4	58.3	34.3	93
	1706010506	187.9	6.6	45.5	55.7	101
	1706010411	174.8	10.2	47.6	61.9	110
	1706010401	287.4	4.0	62.1	50.1	112
	1706010403	340.2	6.2	53.1	73.5	127
Wallowa R.	***Population***	***313.9***	***34.1***	***202.8***	***163.6***	***366.4***
	1706010502	8.7	4.4	20.4	20.8	41
	1706010504	34.9	3.2	10.6	34.3	45
	1706010503	115.7	3.6	42.5	17.4	60
	1706010501	89.0	11.4	68.5	37.0	106
	1706010505	65.7	11.4	60.7	54.1	115
Imnaha R.	***Population***	***534.9***	***18.6***	***143.5***	***329.8***	***473.2***
	1706010202	82.5	2.8	37.9	38.3	76
	1706010203	84.3	2.2	24.4	56.9	81
	1706010201	70.6	4.0	28.6	55.7	84
	1706010204	173.6	3.2	18.2	87.2	105
	1706010205	123.9	6.4	34.3	91.8	126

Population	*HUC-5*	*Not Rated*	*Low*	*Medium*	*High*	*Sum (Hi & Med)*
learwater Lower MS	***Population***	***529.2***	***395.6***	***622.9***	***815.3***	***1,438.2***
	1706010702	135.1	3.2	1.0	16.4	17
	1706030608	15.7	4.6	10.2	27.2	37
	1706030401	16.0	33.8	16.2	32.7	49
	1706030601	11.0	43.7	18.8	30.8	50
	1706030604	15.6	21.4	37.3	21.8	59
	1706030508	13.5	13.6	19.2	55.5	75
	1706030402	22.7	13.2	12.2	65.9	78
	1706030602	16.1	15.2	43.1	35.1	78
	1706030612	13.5	14.6	39.5	41.1	81
	1706030606	31.3	77.5	19.8	67.9	88
	1706030609	46.4	28.6	58.3	34.4	93
	1706030509	21.5	16.6	56.9	40.9	98
	1706030607	16.3	20.4	58.9	57.7	117
	1706030611	33.1	27.0	65.5	53.3	119
	1706030610	28.9	19.4	65.5	55.3	121
	1706030605	49.6	27.2	53.7	78.1	132
	1706030613	43.0	15.4	46.9	101.4	148
Lochsa R.	***Population***	***121.7***	***206.0***	***204.3***	***482.7***	***687.0***
	1706030304	5.0	6.4	7.8	27.6	35
	1706030303	17.3	18.6	14.8	61.5	76
	1706030306	21.7	15.4	17.2	63.1	80
	1706030307	14.5	38.3	29.8	61.9	92
	1706030301	15.4	19.8	33.0	79.9	113
	1706030305	28.3	62.5	45.5	93.1	139
	1706030302	19.5	45.1	56.1	95.5	152
Lolo Cr.	***Population***	***103.3***	***54.7***	***91.5***	***95.9***	***187.5***
	1706030603	103.3	54.7	91.5	95.9	187
NF Clearwater R.	***Population***	***391.2***	***487.9***	***450.5***	***1,102.6***	***1,553.1***
	1706030807	15.7	51.3	8.0	15.8	24
	1706030709	3.8	9.9	14.4	10.8	25
	1706030803	12.5	22.0	12.4	21.2	34
	1706030710	16.9	14.0	10.4	48.3	59
	1706030705	22.2	37.3	30.4	41.3	72
	1706030704	14.7	10.4	14.4	59.1	73
	1706030708	26.9	34.2	32.0	45.1	77
	1706030805	25.5	36.1	16.8	62.5	79
	1706030806	25.5	16.2	36.6	42.9	80
	1706030702	12.4	18.2	24.2	57.3	82
	1706030801	25.4	40.8	18.9	63.1	82
	1706030804	7.9	17.4	13.8	68.9	83
	1706030707	26.7	19.0	26.0	58.7	85
	1706030808	50.3	45.1	46.3	66.5	113
	1706030703	25.4	23.4	36.4	96.1	133
	1706030802	24.0	31.4	28.4	110.7	139
	1706030701	26.5	29.6	45.1	104.3	149
	1706030706	28.9	31.4	35.7	130.2	166

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
Selway R.	***Population***	***156.4***	***272.2***	***240.3***	***686.2***	***926.5***
	1706030109	1.4	0.2	0.6	1.2	2
	1706030105	6.4	4.0	3.4	20.2	24
	1706030106	16.7	4.2	10.0	31.2	41
	1706030108	4.8	10.8	8.8	36.3	45
	1706030103	7.4	14.2	17.8	34.5	52
	1706030104	4.8	13.8	15.4	37.7	53
	1706030101	7.2	25.0	20.8	43.9	65
	1706030204	11.4	45.5	20.0	50.9	71
	1706030202	18.7	34.7	25.6	66.7	92
	1706030107	18.3	19.6	15.0	78.5	94
	1706030102	5.0	20.8	23.4	71.9	95
	1706030203	30.1	27.8	32.3	95.1	127
	1706030201	24.2	51.5	47.1	118.2	165
SF Clearwater R.	***Population***	***267.1***	***116.8***	***199.1***	***418.0***	***617.1***
	1706030504	20.3	8.4	12.0	34.4	46
	1706030505	27.8	9.0	19.8	46.1	66
	1706030506	16.7	14.8	14.4	57.3	72
	1706030502	37.6	15.8	39.5	50.7	90
	1706030503	32.5	25.0	34.9	68.6	103
	1706030507	46.9	19.8	32.1	75.9	108
	1706030501	85.4	23.8	46.5	84.9	131
Secesh R.	***Population***	***121.2***	***187.7***	***238.8***	***453.7***	***692.4***
	1706020805	34.2	41.3	54.1	120.6	175
	1706020804	1.0	5.4	8.4	14.8	23
	1706020802	14.1	16.2	19.2	48.1	67
	1706020806	19.8	29.2	45.3	37.9	83
	1706020803	18.1	42.9	46.5	65.5	112
	1706020801	33.9	52.7	65.3	166.8	232
Asotin Cr.	***Population***	***1,661.9***	***71.1***	***151.6***	***308.0***	***459.6***
	1706010704	280.5	31.8	39.2	14.8	54
	1706010708	402.5	8.2	19.6	43.4	63
	1706010701	204.3	6.2	16.2	55.1	71
	1706010703	335.0	13.4	45.6	49.1	95
	1706010302	439.6	11.4	30.8	145.6	176
Snake R. Hells Canyon tribs	***Population***	***251.6***	***38.9***	***4.2***	***103.0***	***107.2***
	1706010101	20.6	12.8	0.2	16.4	17
	1706010102	87.0	16.2	0.4	31.8	32
	1706010104	144.0	9.8	3.6	54.7	58
Tucannon R.	***Population***	***704.1***	***56.5***	***104.5***	***168.9***	***273.4***
	1706010808	37.4	8.8	2.4	2.6	5
	1706010707	169.3	10.2	21.2	15.6	37
	1706010705	253.3	21.2	36.4	58.1	95
	1706010706	244.1	16.2	44.5	92.5	137

Population	*HUC-5*	*Not Rated*	*Low*	*Medium*	*High*	*Sum (Hi & Med)*
Little Salmon R. and Rapid	***Population***	***316.3***	***328.5***	***138.6***	***471.7***	***610.3***
	1706010301	66.4	6.4	0.6	13.0	14
	1706021004	2.7	3.6	3.6	18.6	22
	1706020909	13.9	53.9	0.6	24.4	25
	1706020907	25.9	33.5	1.6	26.4	28
	1706020910	20.8	29.2	2.6	31.0	34
	1706020903	17.0	54.1	0.2	35.2	35
	1706020905	24.8	38.1	2.8	37.4	40
	1706020908	15.9	7.4	12.8	32.7	45
	1706021001	9.2	14.6	12.6	38.3	51
	1706021002	7.4	15.2	16.4	34.7	51
	1706020906	23.9	10.0	6.8	45.1	52
	1706020904	37.0	15.8	20.8	53.1	74
	1706021003	51.4	46.7	57.1	81.7	139
Big, Camas, and Look Crs.	***Population***	***172.0***	***204.5***	***196.9***	***592.6***	***789.5***
	1706020610	5.0	22.2	13.8	11.8	26
	1706020609	3.4	3.4	4.0	24.0	28
	1706020512	10.1	14.2	11.4	31.4	43
	1706020604	9.8	9.8	12.4	44.7	57
	1706020511	12.5	11.8	9.8	47.9	58
	1706020608	12.8	16.8	20.8	38.3	59
	1706020605	7.6	10.2	11.8	48.3	60
	1706020607	17.7	13.6	19.0	45.7	65
	1706020603	17.9	19.0	21.8	51.1	73
	1706020602	23.0	11.4	11.6	62.3	74
	1706020601	13.2	41.1	22.2	53.9	76
	1706020606	27.8	15.6	18.6	66.1	85
	1706020510	11.1	15.2	19.4	67.3	87
Middle Fk. Salmon R. Up MS	***Population***	***189.2***	***217.7***	***268.0***	***441.6***	***709.6***
	1706020508	7.8	7.4	5.8	21.8	28
	1706020502	14.1	26.2	30.8	22.4	53
	1706020506	19.8	32.4	31.8	33.0	65
	1706020501	20.4	35.6	39.3	28.6	68
	1706020507	8.6	15.4	17.6	51.7	69
	1706020505	22.4	21.0	17.2	64.9	82
	1706020509	26.0	19.6	23.0	80.7	104
	1706020503	47.0	29.2	56.5	55.3	112
	1706020504	23.1	30.6	45.9	83.2	129
Chamberlain Cr.	***Population***	***163.6***	***251.2***	***91.7***	***337.4***	***429.1***
	1706020711	-	0.4	-	2.4	2
	1706020704	2.0	26.0	-	4.2	4
	1706020901	-	0.6	-	4.2	4
	1706020707	7.0	49.1	0.2	6.0	6
	1706020902	6.6	45.3	0.6	29.1	30
	1706020705	7.0	8.4	6.6	25.2	32
	1706020708	13.9	63.9	2.8	37.9	41
	1706020706	14.9	16.0	13.6	30.4	44
	1706020709	21.4	11.8	12.0	36.5	48
	1706020710	46.0	13.2	21.6	54.3	76
	1706020703	44.6	16.4	34.2	107.2	141

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
East Fk Salmon R.	***Population***	***144.7***	***108.7***	***138.8***	***365.6***	***504.4***
	1706020114	16.1	23.8	15.6	25.2	41
	1706020112	10.6	5.0	10.2	35.8	46
	1706020116	17.5	16.0	21.4	31.2	53
	1706020111	10.4	16.6	20.6	40.6	61
	1706020113	17.4	8.6	22.6	42.8	65
	1706020110	11.6	17.2	16.6	52.7	69
	1706020118	32.3	8.8	13.6	60.5	74
	1706020117	28.8	12.6	18.0	76.7	95
Lemhi R.	***Population***	***242.9***	***118.5***	***223.1***	***437.4***	***660.5***
	1706020403	19.4	2.6	11.6	21.8	33
	1706020401	9.7	6.7	25.0	19.4	44
	1706020406	10.4	12.6	16.6	32.6	49
	1706020405	25.0	5.7	13.4	53.1	66
	1706020402	19.2	5.4	33.0	35.8	69
	1706020305	19.0	37.1	15.6	56.7	72
	1706020404	42.3	7.6	30.4	46.5	77
	1706020408	17.6	11.8	28.2	51.1	79
	1706020407	59.1	15.6	15.0	67.5	83
	1706020409	21.1	13.4	34.1	52.9	87
North Fk Salmon R.	***Population***	***73.1***	***72.7***	***43.9***	***148.6***	***192.5***
	1706020308	3.6	24.4	9.8	15.8	26
	1706020307	6.2	22.8	10.0	31.9	42
	1706020306	63.2	25.4	24.0	101.0	125
Pahsimeroi R.	***Population***	***111.3***	***109.8***	***202.3***	***281.0***	***483.3***
	1706020205	5.4	10.0	15.4	0.4	16
	1706020304	7.8	15.0	12.6	15.6	28
	1706020303	10.6	22.3	15.6	25.4	41
	1706020302	14.0	17.0	12.2	34.6	47
	1706020301	14.2	17.2	20.2	39.8	60
	1706020204	6.1	8.6	32.0	31.2	63
	1706020201	21.7	8.6	25.6	45.3	71
	1706020203	3.0	3.2	37.8	36.6	74
	1706020202	28.5	7.8	30.6	51.9	83
Panther Cr.	***Population***	***129.1***	***132.4***	***82.3***	***327.5***	***409.8***
	1706020701	18.5	53.9	0.8	17.0	18
	1706020313	6.0	17.0	8.2	10.0	18
	1706020312	9.6	16.2	13.8	42.1	56
	1706020311	32.3	7.4	9.0	53.7	63
	1706020702	18.9	14.2	14.0	53.3	67
	1706020309	24.6	8.8	19.0	72.1	91
	1706020310	19.2	14.8	17.4	79.3	97
Salmon R. Upper MS	***Population***	***220.2***	***178.0***	***242.9***	***399.9***	***642.8***
	1706020107	-	1.0	2.2	6.4	9
	1706020102	5.0	15.6	17.0	17.4	34
	1706020109	17.3	9.2	7.4	34.0	41
	1706020105	42.9	18.0	24.2	41.5	66

1706020101	24.7	16.8	41.2	31.0	72
1706020108	26.0	23.8	29.4	66.7	96
1706020103	17.6	35.4	38.4	63.7	102
1706020104	46.4	33.8	51.3	54.5	106
1706020106	40.3	24.2	31.6	84.7	116

ESU: Middle Columbia Steelhead

Kilometers of Spawning/Rearing Habitat

Population	***HUC-5***	***Not Rated***	***Low***	***Medium***	***High***	***Sum (Hi & Med)***
Deschutes R. Eastside	***Population***	***2,024.7***	***155.7***	***232.3***	***198.1***	***430.4***
	1707030610	2.8	0.2	3.2	0.4	4
	1707030612	180.4	68.9	0.6	10.8	11
	1707030704	144.6	0.6	24.6	10.0	35
	1707030703	194.2	3.2	24.6	22.6	47
	1707030608	243.4	1.2	23.2	35.5	59
	1707030702	206.2	2.6	41.9	19.0	61
	1707030607	411.0	70.1	21.8	42.7	64
	1707030611	273.8	4.2	46.5	21.6	68
	1707030701	368.2	4.6	45.9	35.4	81
Deschutes R. Westside	***Population***	***728.4***	***70.4***	***266.2***	***207.1***	***473.3***
	1707030705	37.8	2.1	20.5	9.8	30
	1707030604	70.5	5.0	40.8	49.1	90
	1707030603	215.9	29.0	52.1	38.0	90
	1707030605	189.6	13.0	63.5	35.4	99
	1707030606	214.6	21.2	89.3	74.7	164
Fifteen Mile Cr. (winters)	***Population***	***752.8***	***15.2***	***141.8***	***189.4***	***331.2***
	1707010504	72.5	1.6	10.4	19.6	30
	1707010505	104.5	2.8	3.8	36.1	40
	1707010503	174.4	1.6	44.7	76.1	121
	1707010502	401.4	9.2	82.9	57.7	141
Rock Cr.	***Population***	***245.9***	***4.2***	***37.5***	***73.7***	***111.2***
	1707010113	245.9	4.2	37.5	73.7	111
White Salmon R.	***Population***	***130.2***	***42.5***	***86.7***	***148.8***	***235.6***
	1707010510	28.8	7.6	14.6	30.8	45
	1707010509	101.4	34.9	72.1	118.0	190
Klickitat R.	***Population***	***1,088.7***	***128.6***	***315.5***	***430.2***	***745.7***
	1707010512	18.0	7.4	2.4	20.0	22
	1707010604	245.7	40.0	74.3	47.3	122
	1707010603	243.3	8.4	65.1	80.1	145
	1707010602	324.0	37.9	99.6	126.6	226
	1707010601	257.7	34.8	74.1	156.2	230
Umatilla R.	***Population***	***2,099.1***	***97.7***	***489.3***	***393.0***	***882.3***
	1707010313	10.7	19.6	14.4	-	14
	1707010310	130.7	6.2	50.3	14.4	65
	1707010303	155.0	8.8	47.5	19.6	67
	1707010301	83.9	5.6	19.1	56.7	76
	1707010304	209.8	10.6	70.1	14.6	85
	1707010307	232.4	19.4	63.3	26.6	90
	1707010305	230.6	9.0	43.3	51.5	95
	1707010302	201.7	6.8	43.3	51.9	95
	1707010309	453.6	8.2	77.5	66.7	144
	1707010306	390.6	3.4	60.5	91.0	151

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
Walla Walla R.	***Population***	***1,010.3***	***146.4***	***283.8***	***290.6***	***574.4***
	1707010211	177.8	62.1	57.3	18.4	76
	1707010202	87.4	8.8	27.8	51.9	80
	1707010208	174.3	12.2	52.5	45.7	98
	1707010209	142.4	12.4	50.7	49.9	101
	1707010201	90.9	5.2	29.6	79.5	109
	1707010210	337.5	45.7	65.9	45.3	111
Touchet R.	***Population***	***881.4***	***108.5***	***181.2***	***200.3***	***381.5***
	1707010207	180.6	36.9	25.2	5.4	31
	1707010205	168.0	18.2	29.4	11.0	40
	1707010206	161.5	22.0	35.6	7.2	43
	1707010204	159.8	19.8	47.1	47.5	95
	1707010203	211.5	11.6	43.9	129.2	173
Naches R.	***Population***	***843.8***	***130.6***	***341.6***	***455.3***	***796.8***
	1703000301	234.7	15.2	74.1	74.7	149
	1703000202	163.4	22.4	55.9	118.9	175
	1703000201	144.7	47.7	88.3	131.1	219
	1703000203	301.0	45.3	123.3	130.5	254
Toppenish and Satus Cr.	***Population***	***1,624.1***	***246.5***	***250.1***	***342.6***	***592.8***
	1703000304	87.3	91.3	18.2	-	18
	1703000306	414.6	113.5	20.2	27.6	48
	1703000303	372.1	14.4	82.1	140.4	222
	1703000305	750.0	27.2	129.6	174.6	304
Yakiman R. Upper MS	***Population***	***1,861.8***	***263.2***	***458.3***	***608.1***	***1,066.4***
	1703000104	742.9	70.2	73.9	89.3	163
	1703000102	213.3	19.2	70.7	98.5	169
	1703000101	155.6	114.1	104.7	147.5	252
	1703000103	750.0	59.7	209.1	272.7	482
John Day Lower MS Tribs	***Population***	***4,657.3***	***281.0***	***592.1***	***699.1***	***1,291.2***
	1707020414	116.2	26.8	6.8	0.2	7
	1707020405	105.9	24.8	20.0	4.0	24
	1707020112	186.5	4.8	6.8	32.0	39
	1707020115	179.1	11.3	21.8	26.0	48
	1707020114	145.5	1.4	10.0	38.5	48
	1707020407	164.1	1.8	23.6	25.2	49
	1707020406	238.8	2.0	28.6	40.3	69
	1707020113	177.4	5.4	45.8	26.8	73
	1707020413	290.4	10.4	57.1	19.2	76
	1707020409	256.4	30.4	35.1	42.5	78
	1707020402	290.9	26.4	16.4	62.1	79
	1707020412	257.2	16.6	66.9	18.4	85
	1707020410	303.9	39.7	50.1	35.9	86
	1707020404	474.6	31.2	28.4	67.3	96
	1707020403	337.7	2.4	32.2	64.5	97

1707020401	338.8	34.3	20.8	81.9	103
1707020408	407.1	4.0	53.9	52.9	107
1707020411	386.8	7.0	67.5	61.3	129

ESU: Upper Columbia Steelhead

Kilometers of Spawning/Rearing Habitat

Population	HUC-5	Not Rated	Low	Medium	High	Sum (Hi & Med)
Entiat R.	***Population***	***169.4***	***30.4***	***55.4***	***140.1***	***195.5***
	1702001001	169.4	30.4	55.4	140.1	196
Methow R.	***Population***	***625.3***	***135.4***	***205.8***	***511.0***	***716.9***
	1702000801	17.5	13.0	22.0	47.4	69
	1702000803	28.1	10.0	18.8	59.0	78
	1702000802	28.2	14.6	13.0	71.8	85
	1702000804	104.6	14.4	37.8	64.4	102
	1702000805	111.4	18.0	27.8	82.2	110
	1702000807	187.4	31.8	35.4	88.6	124
	1702000806	148.1	33.6	51.0	97.6	149
Okanogan R.	***Population***	***652.5***	***177.2***	***127.8***	***235.8***	***363.6***
	1702000704	-	1.0	-	-	0
	1702000605	66.5	44.6	16.6	35.4	52
	1702000603	104.1	10.0	17.4	50.2	68
	1702000604	225.8	43.6	36.2	36.2	72
	1702000601	90.1	44.2	25.4	56.2	82
	1702000602	165.9	33.8	32.2	57.8	90
Wenatchee R.	***Population***	***944.2***	***169.7***	***241.4***	***477.6***	***719.0***
	1702001002	413.3	12.6	6.8	84.7	91
	1702001102	56.6	24.8	47.0	55.0	102
	1702001101	39.0	41.6	42.4	65.6	108
	1702001103	58.6	28.0	65.0	62.0	127
	1702001105	237.9	32.6	25.4	116.9	142
	1702001104	138.8	30.0	54.6	93.3	148